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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,815	08/21/2003	Zine-Eddine Boutaghou	S01.12-0992	8036

27365 7590 10/24/2005

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EXAMINER

CHEN, TIANJIE

ART UNIT PAPER NUMBER

2652

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/645,815

Applicant(s)

BOUTAGHOU ET AL.

Examiner

Tianjie Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 22-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 19-21 and 28-32 is/are rejected.
- 7) ☒ Claim(s) 12, 14-18 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Non-Final Rejection

Election/Restrictions

1. Applicant's election without traverse of Claims 1-21 in the reply filed on 08/08/2005 is acknowledged.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, 13, 19, and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tam et al (US 5,421,943) in view of Schott (US 6,349,017).

Claim 1, Tam shows slider 11 used for data storage device (Fig. 5, column 3, line 45-49 and column 5, lines 10-14). Schott shows a suspension assembly in Fig. 5 having a slider 16 on it. Schott teaches that his suspension assembly is reliable and having effective ESD path (column 2, lines 39-43). It is well known in the art that the slider is to be used with a suspension assembly. Schott's suspension assembly is reliable and has effective ESD path. One of ordinary skill in the art would have been motivated to add Tam et al's slider onto Schott's suspension assembly.

Thus constructed device is a suspension assembly including: a slider body 16/11 having a trailing edge face 52b; a bond pad 54A positioned on the trailing edge face; a conductive trace 34A connected to the bond pad to form an electrical connection; a heating element 15 in Tam including a low resistivity portion 53 (Fig. 3D in Tam) and a high resistivity portion 51, the high resistivity portion of Tam would

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be positioned proximate the electrical connection in the combined device; and an insulating component 24 (In Tam's Fig. 5) positioned between the conductive trace and the heating element proximate the electrical connection.

Claim 2, the high resistivity portion 51 has a smaller thickness than the low resistivity portion 53 (Fig. 3D).

Claim 3. Tam's Fig. 3A shows the high resistivity portion includes an undulating pattern positioned proximate the bond pad.

Claim 4. Schott shows four bond pads 54A-D are positioned on the trailing edge face and four conductive traces 34A-D are connected to the four bond pads to form electrical connections and wherein the high resistivity portion is positioned proximate each of the electrical connections.

Claim 5, the high resistivity portion is positioned in a plane generally perpendicular to the trailing edge face as the face opposite to the face marked 16 in Schott's Fig. 5 is defined as the trailing edge face:

Claim 6, the high resistivity portion is positioned in a plane generally parallel to the trailing edge face (Fig. 5).

Claim 7, the conductive trace 34A-D is positioned in a flex circuit.

Claim 8, the conductive trace 34A includes a trace bond pad 42A and a bonding component 22 is positioned on the trace bond pad. the bonding component providing an electrical conduit between the bond pad and the trace bond pad.

Claim 13, above constructed device is a suspension assembly including: a slider body having a trailing edge face and at least one bond pad positioned on the trailing edge face; and means 22 for providing an electrical connection between a conductive trace 34A and the at least one bond pad 54A.

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Claim 19, wherein the means for providing are positioned on a flex circuit.

Claim 28, above constructed device is a suspension interconnect, including: a conductive element; a heating element including a low resistivity portion and a high resistivity portion; and an insulating component positioned between the conductive element and the heating element.

Claim 29, the high resistivity portion has a smaller thickness than the lower resistivity portion.

Claim 30, the high resistivity portion includes an undulating pattern.

Claim 31, wherein at least two bond pads are electrically interconnected to at least two conductive elements.

3. Claims 9-11 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over tam et al in view of Schott as applied to claims 1 , 7, and 28 above, and further in view of Berg et al (US 6,704,256).

Claims 9-11 and 32, Tam shows a heating element, wherein the power is fed from the pulse generator 17, but fails to show the way of pass the power.

Berg et al shows a suspension assembly, wherein a single flex is used to pass the signal and power. It is a commonly used method of passing the signal and power (Column 5, lines 33-39). One of ordinary skill in the art would have been motivated to use a flex for passing signal as well as the power for the heating element.

4. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over tam et al in view of Schott as applied to claims 13 above, and further in view of Amemiya et al (US 6,002,550).

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Claim 20, Schott show a means of ultrasonic is used for bonding (Column 5, lines 6-8). Amemiya et al shows that ultrasonic and heating are alternative used for bonding (Column 21, lines 57-62). One of ordinary skill in the art would have been motivated to include heating as means for bonding to heat a bonding component to provide an electrical conduct between the conductive trace and the at least one bond pad.

Claim 21, the bonding component is positioned on a portion of the conductive trace.

Allowable Subject Matter

5. Claims 12, 14-18, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- With regard to claims 12 and 33, as the closest reference, combination of Tam et al (US 5,421,943) and Schott (US 6,349,017) show is a suspension assembly including: a slider body having a trailing edge face; a bond pad positioned on the trailing edge face; a conductive trace connected to the bond pad to form an electrical connection; a heating element including a low resistivity portion and a high resistivity portion; but **fails to show** that heating element is adapted to provide heat to a bonding component, wherein the bonding component provides an electrical conduit.
- With regard to claim 14, as the closest reference, combination of Tam et al (US 5,421,943) and Schott (US 6,349,017) show a suspension assembly including: a slider body having a trailing edge face and at least one bond pad positioned on the trailing edge face; and means for providing an electrical connection between

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a conductive trace and the at least one bond pad, but **fails to show** that the means include a heating element having a high resistivity portion and a low resistivity portion.

- Applicant asserts that this invention solves the problem of difficulties arise in aligning and providing external heating system to cause reflow of the ball bonds, and consequently a weak interconnect, which leads to an increased potential failure mode of the electrical connection (Specification, p. 2).

Conclusion

6. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is 571-272-7570. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


TIANJIE CHEN
PRIMARY EXAMINER